

REMARKS

Applicants have now had an opportunity to carefully consider the Examiner's comments set forth in the Office Action of March 1, 2004. Reexamination and reconsideration of claims 2, and 4-11 are respectfully requested.

The Office Action

Claim 1 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent number 6,144,120 issued to Doi et al. (Doi) in view of U.S. Patent number 6,286,804 issued to Shiga et al. (Shiga). The Examiner apparently erred in referencing U.S. Patent No. 6,286,804 since this patent was issued to Avinger et al. Applicants assume herein that the Examiner meant to refer to U.S. Patent No. 6,093,984 as in the previous Office Action.

Claim 2 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Doi et al. in view of Shiga et al., and further in view of U.S. Patent number 6,286,804 issued to Avinger et al. (Avinger).

Claims 5 and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Doi et al. in view of Shiga et al. as applied to claim 1, and further in view of U.S. Patent number 5,456,406 issued to Lemelson.

Claim 7 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Doi et al. in view of Shiga et al. as applied to claim 1, and further in view of U.S. Patent number 6,161,443 issued to Biesecker et al.

Claims 8 and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Doi et al. in view of Shiga et al., U.S. Patent number 4,859,394 issued to Benton et al. (Benton), and U.S. Patent number 3,276,852 issued to Shattuck.

Claim 9 also stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Doi et al. as modified by Shiga et al., Benton et al., and Shattuck and further in view of U.S. Patent No. 6,492,751 issued to Ineson et al.

Claims 4 and 10 were indicated as containing allowable subject matter.

Th Art Rejections**The Present Application:**

For purposes of a brief review, the present application is directed to providing a linear type actuator in which a rotor unit is manufactured by insert molding. A nut serves as a motion converting means, which plays an important part in a linear type actuator. The linear actuator further comprises a field magnet and a magnet stopper. Such a design reduces the material cost and improves productivity, thereby achieving a cost reduction.

The Present Application Distinguishes over the References:

Claims 4 and 10 have been rewritten in independent form. As the Examiner stated that claims 4 and 10 would be allowable if rewritten in independent form, claims 4 and 10 should now be in condition for allowance.

Claims 2 and 5-7, as amended, depend from claim 4 and should, likewise, be in condition for allowance.

With reference now to the Examiner's rejection of independent claim 8 as being unpatentable over Doi in view of Shiga, further in view of Benton, and further yet in view of Shattuck, Applicants wish to point out, as shown in Figures 2B-2D and 3 of the present application, that it is significant that the nut 23 as a conversion means is made of a material such as polyphenylene sulfide (PPS), for example, which is different from the material of the resin portion 26 of the rotor unit 20. The resin portion 26 of the rotor, for example, is made of polybutylene terephthalate (PBT). As a result, appropriate selection of materials for the nut 23 becomes possible, resulting in a cost reduction because the material used for the nut 23 is usually more expensive than the material used for the resin portion 26. Also, appropriate engagement between the output shaft 30 and the screw of the nut 23 can also be expected.

The stepping motor of Doi, at first glance, seemingly has a similar structure to the linear type actuator of the present application. However, when reviewed in detail, the through hole 12, as shown in Figures 1A-1B of Doi, is formed so as to be coaxial with the axis of rotation of the rotor 4, and having a screw thread formed therein (col. 5, lines 48-50). The screw thread is formed simultaneously with resin-molding material of the rotor 4, which means that the

rotor 4 is formed of the **same** material as the screw thread. Claim 8 of the present application, as amended, includes a limitation such that the conversion means 23 is made of a second resin material, and the rotor includes a resin portion made of a first resin material. The first and second resin materials are required to be **different**. This means that Doi neither teaches nor suggests the claimed subject matter of independent claim 8, as amended.

Shiga discloses only the stator and outer rotor of a three-phase DC brushless motor, but not any motor structure of the linear type actuator as claimed in the above-described subject matter of claim 8 of the present application (Abstract, col. 4, lines 34-47, col. 6, lines 30-42, and Figure 3). It is apparent, therefore, that Shiga also does not cure this shortcoming of Doi.

Similarly, neither Benton nor Shattuck cure this shortcoming.

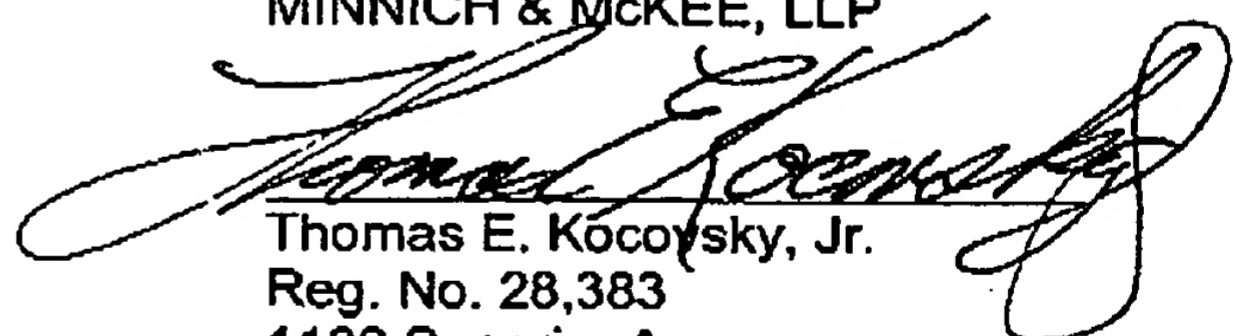
No new matter has been added to claim 8. Accordingly, it is submitted that claim 8 along with dependent claims 9 and 11 are now in condition for allowance.

CONCLUSION

For the reasons detailed above, it is respectfully submitted all claims pending in the application (Claims 2 and 4-11) are now in condition for allowance.

Respectfully submitted,

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